Final Solar Ponds Plume
Decision Document Modification
June 25, 2002

This document is a minor modification to the Solar Ponds Plume Decision Document (DOE 1999) which addressed the remediation of the Solar Ponds Plume (SPP). After the installation of the remediation system was completed in 1999, it was apparent that the treatment system itself was functioning properly, but that not all of the captured groundwater was getting to the treatment cell. The objective of this modification is to increase the amount of water treated by the treatment system by installing a collection sump in the existing collection trench and pumping groundwater into the existing treatment cell.

As stated in the Decision Document, the Solar Ponds groundwater plume contains low levels of nitrate and uranium generally attributed to storage and evaporation of radioactive and hazardous liquid wastes in the Solar Evaporation Ponds from 1953 to 1986. In September 1999, the original Interceptor Trench System (ITS) was replaced with a 1,100-foot-long collection system, that utilized portions of the ITS, and passive treatment cells containing iron and wood chips.

Groundwater was expected to be intercepted and flow by gravity to the treatment cell without detention in the collection trench. Because the Preble's Meadow Jumping Mouse (a Federally Listed Threatened Species) is present at the optimal location for flow-through treatment cells, the treatment cells were located immediately adjacent to the collection trench, not 400 feet downgradient as originally planned. As a result, groundwater in the collection trench must reach a height of approximately 11 linear feet at the treatment system inlet to develop sufficient hydraulic head for the groundwater to flow into the first treatment cell. This design causes water to backup along several hundred feet of the collection trench length. Table I shows the range of water level elevations in piezometers that run the length of the trench. The intent of the original design was to only have enough head in the trench for the water to flow to the treatment cell. Installation of the collection sump to transfer water from the collection trench directly into the treatment cells will allow the collection trench to operate in the manner that was originally intended.

Table I Ground Water Elevation in Solar Pond Plume Treatment System Piezometers

	West End of Trench	←		→	East End of Trench
Piezometer	**70799**	**Temporary Piezometer**	**71099**	**70899**	**70999**
Depth to Water (Feet Below Surface)	13.7 to Dry[1] (19.59)	16.64 to 22.4	15.92 to 22.25	15.41 to Dry[1] (20.82)	20.15 to Dry[1] (21.47)
Water Elevation (Feet Above Sea Level)	Dry[1] (5881) to 5887	5879 to 5886	5879 to 5886	Dry[1] (5881) to 5886	Dry[1] (5899) to 5900

1 – Total depth of piezometer is in parenthesis for "dry" readings.

In order to reduce the hydraulic head in the trench and increase the volume of groundwater treated, it is proposed that a sump containing a pump be placed at the lowest point of the collection trench which is directly in front of the Treatment Cell where water is currently extracted. Figure 1 shows the location of the existing treatment system and where a collection sump would be installed. The sump will be similar to a domestic water well containing an in-well pump. The sump will be installed away from the geomembrane to keep from damaging it. It is anticipated that the sump will be between 12 and 20 inches in diameter. The sump will be constructed out of slotted screen. It will be advanced into the sand lining the trench bottom. The lower portion of the sump will be installed with a drill rig whereas the upper portion will be excavated down to the influent line that feeds the treatment system, approximately fifteen feet in depth. Removed soils will be stored and used for backfill at the end of construction.

A solar-powered submersible pump will be placed in the sump as shown in Figure 2. The pump discharge line will be constructed of flexible tubing, which will be fed down the treatment cell influent line. The end of the existing treatment cell influent line will be left open in the trench so that, if groundwater rises to the influent line, groundwater can still also gravity flow into the treatment system. The pump will have a maximum capacity of about 5 gallons per minute to keep the pump from cycling on and off. The pump control system will consist of a low level

and high level switch, which will maintain the water level in the sump between 20 and 25 feet deep (5 to 10 feet below the existing influent line).

In addition to adding a pump, two piezometers will be added in the locations shown on Figure 1. These piezometers will be used to measure downgradient water elevations and to determine gradient and direction of flow. Both piezometers will be installed using a push-type sampler and will be screened into bedrock.

The excavated area will be backfilled with the soils removed during the installation of the sump. Once the backfill is compacted, the disturbed area will be revegetated with native plants.

In conclusion, it is anticipated that the addition of a collection sump will allow the system to function as it was originally intended. This modification conforms to the original criteria and alternative selected in the Solar Ponds Plume Decision Document (DOE 1999) and therefore, does not constitute a change in the alternative evaluation. The criteria for decision-making are included in the original Solar Ponds Plume Decision Document and will not be modified by the installation of the pump.

References

DOE, 1999, Final Solar Ponds Plume Decision Document, RF/RMRS-98-286.UN, June.

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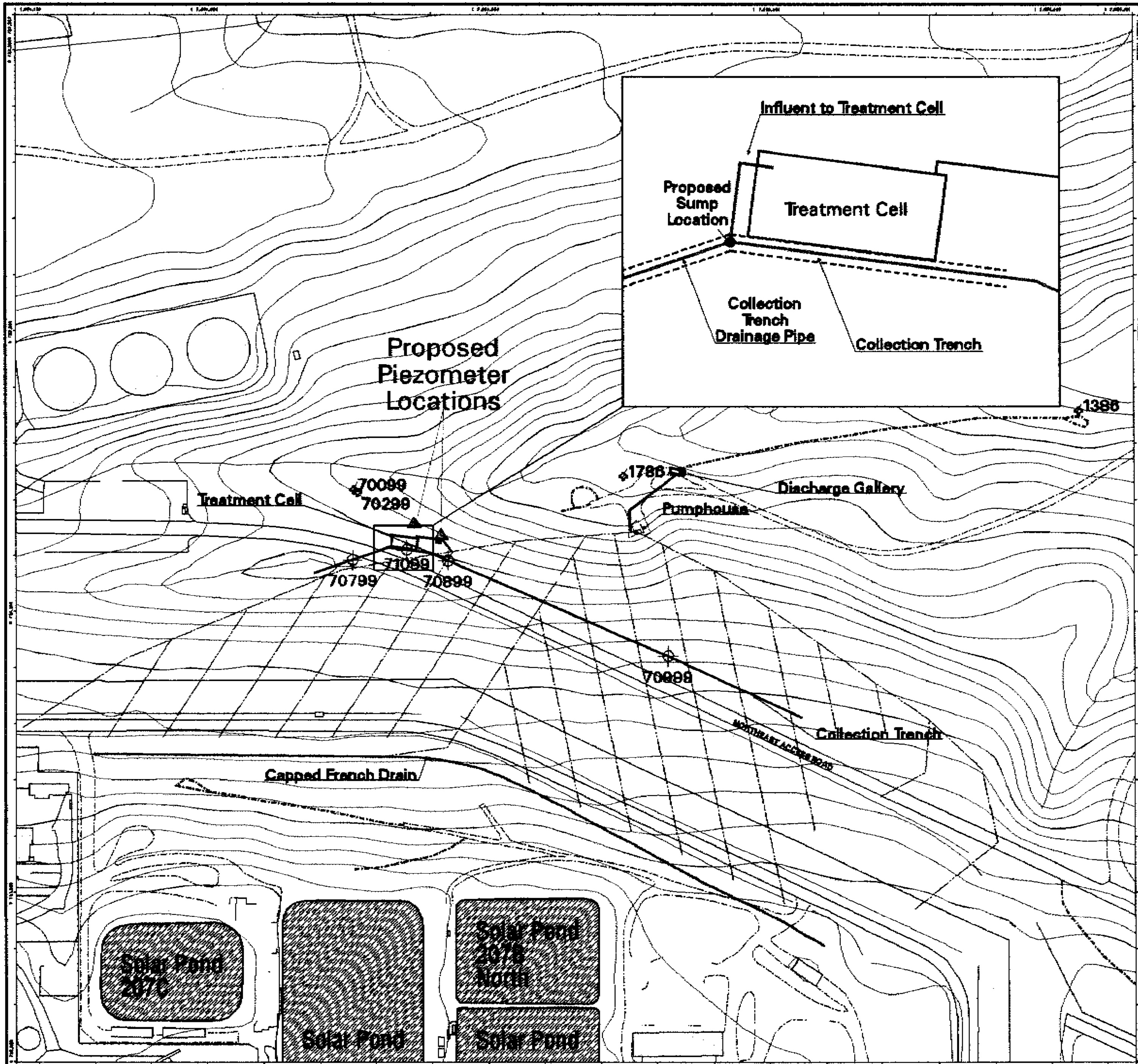

Figure 1

Solar Ponds Plume Treatment System Location of Modification

EXPLANATION

- In Trench Piezometer Location
- Monitoring Well
- Interceptor Trench System
- New Solar Pond French Drain
- Collection Pipe
- Collection Trench

Standard Map Features

- Buildings and other structures
- Solar Evaporation Ponds (SEPs)
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Topographic Contour (5-Foot)
- Paved roads
- Dirt roads

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: DynCorp

Prepared for: KAISER-HILL COMPANY

NT_Svr w:/projects/fy2002/02-0630/solar_pond_piez.aml

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Figure 2
Conceptual Drawing of Collection Sump and Solar-Powered Pump
(Not to Scale)